

**CLAIMS:**

What is claimed is:

1. An electronic circuit comprising:
  - a first electrode for electrical connection to an ionization detector system;
  - a second electrode for electrical connection to an ionization detector system; and
  - a transformer electrically connected to the first electrode and to the second electrode for creating a spark between the first electrode and the second electrode.
2. The electronic circuit of claim 1, further comprising a first resistor electrically connected to a secondary coil in a secondary portion of the transformer.
3. The electronic circuit of claim 2, further comprising a second resistor electrically connected to the secondary coil in the secondary portion of the transformer.
4. The electronic circuit of claim 3, wherein the second resistor is connected in series with the first resistor.
5. The electronic circuit of claim 3, wherein the second resistor is connected in parallel with a diode.

6. The electronic circuit of claim 1, further comprising a conjugated clock input electrically connected to the transformer.
7. The electronic circuit of claim 1, wherein the transformer comprises:  
a primary portion including a primary coil; and  
a secondary including a secondary coil, wherein the primary coil includes a different number of loops than are present in the secondary coil.
8. The electronic circuit of claim 7, wherein the primary coil includes a greater number of loops than are present in the secondary coil.
9. The electronic circuit of claim 1, further comprising a DC voltage source electrically connected to a primary portion of the transformer.
10. The electronic circuit of claim 9, further comprising a current monitor electrically connected to the DC voltage source.
11. A method of generating an electrical discharge for an ionization detector system comprising:  
providing a first electrode and a second electrode, each electrically connected to an ionization system;  
providing a transformer electrically connected to the first electrode and the second electrode;  
inputting a DC voltage into the primary portion of the transformer; and  
generating a discharge current between the first electrode and the second electrode.

12. The method of claim 11, wherein the providing the transformer step comprises including a first resistor in a secondary portion of the transformer.
13. The method of claim 12, wherein the providing the transformer step comprises including a second resistor in the secondary portion of the transformer.
14. The method of claim 13, wherein the providing the transformer step comprises connecting the second resistor in parallel with a diode.
15. The method of claim 13, further comprising monitoring a current input.
16. The method of claim 13, wherein the providing the transformer step comprises providing a primary coil and a secondary coil in the transformer wherein the primary coil and the secondary coil include a different numbers of loops.
17. The method of claim 16, wherein the providing the transformer step comprises providing the primary coil to have a greater number of loops than the secondary coil.
18. The method of claim 12, wherein the generating the discharge current step comprises generating a substantially constant steady-state current plateau.

19. The method of claim 12, wherein the generating the discharge current step comprises generating a current having at least a first steady-state current plateau and a second steady-state current plateau.
20. The method of claim 19, wherein the generating the discharge current step comprises providing the net amplitude of a first steady-state current plateau exceeding the amplitude of a second steady-state current plateau.